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Factor Validation of the Consideration of Future Consequences Scale: Evidence for a Short Version

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ABSTRACT. The author examined the factor structure of the 12-item Consideration of Future Consequences (CFC) Scale (A. Strathman, F. Gleicher, D. S. Boninger, & S. Edwards, 1994) among 664 undergraduate university students enrolled in human development courses. A principal-components factor analysis with varimax rotation yielded 2 factors. The author used confirmatory factor analysis procedures to examine the fit of 4 models, according to the principal-components factor analysis findings, with the observed covariance. The author used a number of fit indices to compare the 4 models. Both sets of analysis provided the greatest support for an 8-item short version of the CFC Scale. The author discussed findings in regard to the CFC Scale as an instrument to measure future time perspective.

Key words: consideration of future consequences

IN RECENT YEARS, INTEREST IN THE FUTURE TIME PERSPECTIVE (FTP) has resurged. Earlier studies of time perspectives focused on construct definition and speculation about its influence on motivation and social behavior (Fraisse, 1963; Lewin, 1942; Nuttin, 1964). Some of the empirical studies of the FTP have involved its impact on academic achievement (DeVolder & Lens, 1982; Joireman, 1999) and health concerns (Strathman, Gleicher, Boninger, & Edwards, 1994), as well as its relationship to general clinical symptoms (Zimbardo & Boyd, 1999).

More recently, researchers (Karniol & Ross, 1996; Zimbardo & Boyd, 1999) have noted a continued need for valid and reliable instruments designed to measure FTP. One type of FTP construct is the consideration of future onsequences (CFC) construct proposed by Strathman et al. (1994). The CFC construct has

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been identified as a stable consequential individual-difference construct that is most efficiently measured by the 12-item CFC Scale, one of the most commonly used FTP measures in social psychological research. The CFC is a motivational construct; it enables an individual to perceive what his or her future field might require or demand behaviorally, in order to reach desired outcomes. More specifically, the CFC refers to the extent to which people prefer to construct the future by considering distant versus immediate consequences of potential behaviors and the extent to which behavior is influenced by such perceived outcomes (Boninger, Gleicher, & Strathman, 1994; Strathman et al.).

The CFC has been examined as a potential variable that might reduce the discontinuity from the level of competitiveness between individuals and groups (Insko et al., 2001; Insko et al., 1998). Currently, the examination of the relationship between the CFC and such discontinuity has produced inconsistent results. More consistently, the CFC has been moderately correlated with health and environmental behaviors, such as cigarette use (Petrocelli, 1997; Strathman et al., 1994), recycling behavior (Lindsay & Strathman, 1997), and academic achievement (Joireman, 1999; Petrocelli).

Zimbardo and Boyd (1999) demonstrated the benefits of empirically scrutinizing measures of time perspective by closely examining the psychometric properties of the Zimbardo Time Perspective Inventory. Less empirical attention has been given to the validation of the CFC Scale. However, because of its use in a wide range of studies and its somewhat inconsistent results, further empirical validation of the CFC Scale is warranted.

Strathman et al. (1994) evaluated the factor structure of a 24-item CFC Scale with 167 respondents and found that the results of a principal factor analysis suggested that the CFC construct was being measured by a subset of 12 items. Further evidence for a one-factor solution was provided by confirmatory factor analysis with a separate sample of 323 respondents who completed the final 12-item CFC Scale. Evidence of adequate interitem consistency has also been recorded (Cronbach's α ranging from .80 to .86; Strathman et al.).

Petrocelli (1997) also examined the factor structure of the CFC Scale with 108 respondents in a study of risk-taking behavior and found preliminary evidence for two factors. Furthermore, several researchers (Comrey, 1973; Glick et al., 2000) have argued that factor solution results based on samples of fewer than 500 respondents are to be considered potentially unstable. To date, no researchers have reported examining the factor structure of the 12-item CFC Scale with more than 323 respondents. Apparently there might be more than one factor reflected in the CFC Scale. So, the present study was designed to closely examine its factor structure.

Method

Participants

Students in 15 undergraduate human development classes ($N = 664$) at a large university in the northeastern region of the United States participated in the present study. The total sample consisted of 414 women and 250 men (mean age = 20.49 years, *SD* = 4.01). The racial distribution of the sample was 55.7% Caucasian, 7.1% African American, 2.2% Hispanic; 35.0% did not indicate their race.

Materials and Procedure

The original 12-item version of the CFC Scale (Strathman et al., 1994) was administered to participants in their respective classes under untimed neutral conditions. Participants were asked to respond to each item by using a 5-point scale ranging from 1 (*extremely uncharacteristic*) to 5 (*extremely characteristic*). In accord with the scoring procedure of the CFC Scale, 7 items were reverse scored. Raw scale scores were summed and divided by 12. "Often I engage in a particular behavior in order to achieve outcomes that may not result for many years" and "I only act to satisfy immediate concerns, figuring the future will take care of itself" (a reverse-scored item) were 2 sample items.

Participation was voluntary, and no incentives were offered. Subsequent to the last class administration of the CFC Scale, I revisited classes and briefed them about the purpose of the study. Questions about the nature of the study were answered.

First, the CFC Scale was evaluated with principal-components factor analysis with varimax rotation. Next, confirmatory factor analysis procedures were used via maximum likelihood estimates from the covariance matrix. Four separate models were examined in light of the principal-components factor analysis findings.

In their examination of the CFC Scale, Strathman et al. (1994) used two less common goodness-of-fit indices: the χ^2/df ratio, and LISREL's root mean square residual (RMSR; Jöreskog & Sörbom, 1981). Strathman and his colleagues reported that "acceptable" and "adequate" fit was achieved from the χ^2/df ratio method and the RMSR method, respectively. However, Marsh, Balla, and McDonald (1988) indicated that the RMSR is often inadequate as a stand-alone fit index. Because the RMSR has been shown to have several limitations as a measure of intermodel differences (Kumar & Sharma, 1999), it was not computed for the present sample as a way to compare the findings of Strathman et al. with the present findings. Rather, comparisons of the relative fit of different models with the present sample were obtained through chi-square difference tests (Bollen, 1989), which determine whether differences in fit are statistically significant. The goodness-of-fit index (GFI) has been identified as an adequate measure of intermodel differences (Kumar & Sharma), and so it too was used to compare the four models.

Overall, in the present study, I used the following fit indices: the χ^2 index, the χ^2/df ratio, the standardized χ^2 index, the comparative-fit index (CFI), the GFI; and the adjusted goodness-of-fit index (AGFI). Bentler and Bonett (1980) noted that the chi-square index is inadequate as a stand-alone goodness-of-fit index because of its sensitivity to both small and large sample sizes. The χ^2/df

ratio does not vary with sample size. Although Strathman et al. (1994) noted that Wheaton, Muthen, Alwin, and Summers (1977) suggested that a ratio of 5:1 indicated adequate fit for the χ^2/df ratio, researchers lack consensus as to what constitutes a good fit for this statistic (Bollen, 1989; Carmines & McIver, 1981). Thus, the standardized chi-square index (Bollen, 1989) was used to evaluate chi-square statistics. Bollen (1989) argued that an advantage of the standardized chi-square index over the χ^2/df ratio is that it controls for the standard deviation of the χ^2 variate. However, the standardized χ^2 also has an ambiguous cutoff point for a "good fit." CFI, GFI, and AGFI scores of .90 and greater indicate good fit (Bentler, 1990; Jöreskog & Sörbom, 1989; Tanaka, 1987).

Results

The sample descriptive statistics for the 12-item CFC Scale ($M = 3.51$, $SD = 0.61$) were similar to those reported in the Strathman et al. (1994) study. Cronbach's α for the total scale was .82. A gender difference occurred; the men ($M = 3.43$, $SD = 0.62$) scored significantly lower than the women ($M = 3.55$, $SD = 0.60$), $t(662) = 2.51$, $p < .02$.

Exploratory Factor Analysis

To assess the structure of the CFC Scale, I subjected all 12 items to a principal-components factor analysis with varimax rotation. The initial factor solution of the present sample resulted in two factors with eigenvalues greater than 1. The two-factor solution accounted for 44.7% of the variance. A minimum factor loading of .40 was used as a guideline for considering an item to be part of a factor. Factor loadings are displayed for each item in Table 1. Cronbach's αs of .82 and .48 were attained for Factor 1 and Factor 2 respectively. The sample attained relatively higher scores on Factor 1 ($M = 2.27$, $SD = 0.48$) than on Factor 2 ($M = 1.23$, $SD = 0.19$). The Pearson product–moment correlation between the two factors was .54, $p < .01$. A gender difference was obtained for Factor 1 where men ($M = 2.20$, $SD = 0.48$) again scored significantly lower than women ($M = 2.31$, $SD = 0.48$), $t(662) = 2.82$, $p < .02$. No statistically significant difference was obtained for Factor 2 between genders.

Confirmatory Factor Analysis

To verify the factor structure of the CFC Scale obtained from the exploratory analysis, a confirmatory factor analysis of the covariance matrix was used. Using LISREL 8.20 (Jöreskog & Sörbom, 1998), I examined four separate maximum likelihood solutions, to verify the relationship between the observed variables and the latent construct(s).

I first examined a model similar to the confirmatory factor analysis of Strathman et al. (1994)—a one-factor solution with all 12 items. This model fit

TABLE 1. Loadings for Varimax-Rotated Two-Factor Solution for the Consideration of Future Consequences Scale ($N = 664$)

Item	Factor loading 1	2	Communality
4[a]	.75[b]	.13	.58
11[a]	.74[b]	.28	.63
3[a]	.74[b]	.21	.41
12[a]	.63[b]	.11	.41
5[a]	.55[b]	.04	.30
10[a]	.53[b]	.46	.49
9[a]	.49[b]	.34	.35
2	.45[b]	.43	.39
8	−.13	.69[b]	.50
6	.12	.60[b]	.37
7	.28	.57[b]	.40
1	.40	.41[b]	.33

[a]Reverse-scored item. [b]Higher factor loading.

adequately with the observed covariance, $\chi^2(54, N = 664) = 266.16, p < .001$; $\chi^2/df = 4.93$; standardized $\chi^2 = 20.42$; CFI = .901; GFI = .937; and AGFI = .909. As expected, this finding was similar to the model of Strathman et al., $\chi^2(54, N = 323) = 222.41, p < .001$; $\chi^2/df = 4.12$. The second model, with two uncorrelated latent factors and 12 items, produced a similar fit, $\chi^2(54, N = 664) = 232.07, p < .001$; $\chi^2/df = 4.30$; standardized $\chi^2 = 17.14$; CFI = .918; GFI = .945; and AGFI = .920. A third model, with two correlated latent factors and 12 items, produced a similar fit, $\chi^2(53, N = 664) = 232.07, p < .001$; $\chi^2/df = 4.38$; standardized $\chi^2 = 17.89$; CFI = .918; GFI = .945; and AGFI = .919. Finally, a fourth model, with only one latent factor and the 8 items from Factor 1, also produced an adequate fit with the observed covariance, $\chi^2(20, N = 664) = 106.48, p < .001$; $\chi^2/df = 5.32$; standardized $\chi^2 = 13.68$; CFI = .945; GFI = .961; and AGFI = .931.

With the six fit indices and their respective recommended cutoffs, examination of all four models revealed greater evidence for a shorter, 8-item version of the CFC Scale. Again however, comparisons of the relative fit of different models within the sample required chi-square difference tests (Bollen, 1989) to show whether differences in fit were statistically significant. Three chi-square difference tests were computed to compare the first three models with the fourth model: for Model 1 versus Model 4, $\chi^2(34, N = 664) = 159.68, p < .001$; for Model 2 versus Model 4, $\chi^2(34, N = 664) = 125.59, p < .001$; and for Model 3 versus

Model 4, $\chi^2(33, N = 664) = 125.59, p < .001$. Each of these tests, along with the models' respective GFI scores, suggests that it is very unlikely that any of the first three models are correct. The reduction in the number of items (or the exclusion of Factor 2 items) led to a significant improvement in fit. Because of the overwhelming number of assumptions in latent variable analysis, Bollen (1989) argues that the chi-square difference test must be interpreted with the same caution as the χ^2 fit index.

Discussion

The purpose of the present study was to closely examine an instrument intended to measure the extent to which individuals consider future consequences of behavior. The original 12-item CFC Scale is one of the most commonly used FTP measures in social psychological research. The primary intention of examining the CFC Scale was to provide further evidence for its validity and to improve upon the current literature that supports its use. However, the results found here suggest that the 12-item CFC Scale is unstable and that it might be more appropriate to use an 8-item scale when attempting to measure the CFC construct.

The CFC Scale purports to measure the degree to which one considers potential distant consequences of current behaviors and the extent to which behavior is influenced by the consideration of potential consequences. The results of an exploratory factor analysis of the original 12-item CFC Scale yielded two distinct factors. Factor 1 and Factor 2 are almost exclusively reserved for reverse-scored items and non-reverse-scored items, respectively (see Table 1), with the exception of Item 2. Little support was found for the stability of Factor 2, which attained poor internal consistency. Further, confirmatory factor analysis showed that an 8-item scale, representing Factor 1, fit considerably better with the observed covariance than did any of the other three models that included Factor 2 items.

Although Factor 1 and Factor 2 consist of items from the same scale, the correlation between them is not very high. The gender differences between the 12-item scale and Factor 1, in the absence of a gender difference in Factor 2, also suggest that Factor 1 and Factor 2 are indicative of different constructs. No researchers have reported examining a gender difference in the CFC Scale. However, other investigators, such as Zimbardo and Boyd (1999) and Zimbardo, Keough, and Boyd (1997), have noted that women tend to have higher scores than men on scales that measure FTP.

Interestingly, Halpern (1992) has implied that such cognitive differences might, in part, be due to the differences in gender role development. Support for this notion might be found among differences in the stereotypes about the play patterns of boys and girls. Whereas boys tend to engage in at-the-moment competition and conflict, girls might tend to engage in activities that enable them to act out stereotyped futures, such as those involving marriage and household duties. Thus, if females tend to have a longer FTP than males, and this effect is found among Factor 1 but not Factor 2, then there is more evidence to suggest that Factor 2 is not adequately measuring FTP.

Each of the positively worded items of the CFC Scale appears to deal with intentional and active efforts to consider future consequences and to influence them positively with current behavior. Again, each of these items except Item 2 was loaded on Factor 2. All of the reverse-scored items, loaded on Factor 1, deal with intentional and active efforts to concern oneself with immediate consequences of behavior, as well as the belief that sacrificing immediate desires is not important for attaining desired outcomes in the distant future. Statistically, there is little reason to assume that the lack of focus on short-term outcomes automatically indicates a concern for distant outcomes of current behavior. Factor 2 items clearly deal with a concern for future consequences of behavior. Yet, their poor internal consistency suggests that there might be more facets of the CFC than originally believed. Therefore, it might be more appropriate to consider the CFC Scale as indicating the extent to which an individual is not influenced primarily by the immediate consequences of behavior.

The evidence here, revealing the instability of the original 12-item CFC Scale, especially for Factor 2, might explain some of the inconsistent results found by Insko and his colleagues (Insko et al., 2001; Insko et al., 1998). Specifically, they were interested in examining competitiveness with respect to one's anticipation of the future and a tendency to think abstractly. The inconsistent results suggested that the CFC Scale more adequately measures one's preference for orderliness than an inclination to reason abstractly. However, Insko and his colleagues also assumed that the CFC Scale measures one factor (the extent to which people prefer to construct the future by considering distant versus immediate consequences of potential behaviors). Thus, the measurement of the CFC in such studies might have been diluted by the four items that do not appear to improve the measurement of the primary factor. If the CFC Scale is a better measure of the extent to which people do not focus on the immediate consequences of behavior than of the extent to which people focus on the distant consequences of behavior, then the previous inconsistent results might also be due to the notion that lacking a preoccupation with immediate consequences of behavior does not adequately measure one's tendency to think abstractly by considering future consequences of behavior.

Although the present investigation has examined the CFC Scale among the largest sample reported. one limitation involved the academic setting of which the sample is representative. Little is known about how the factor structure of the CFC Scale holds for nonacademic settings. Subsequent use of the 8-item CFC Scale might also contribute to other areas of inquiry by ensuring better construct validity than the 12-item scale. Further study of factors and constructs that are likely to converge with the CFC, or variables expected to discriminate between high and low CFC scorers, is certainly warranted.

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